4798

RENEWAL OF PERMITS TO OPERATE-NINE STORAGE TANKS-AT THE FEMP (OEPA) NO. 1431110128 T062, T063, T064, T065, T066, T068, T069, T070, T071

09/21/93

C:RP:93-0161
FERMCO/OEPA
65
PERMIT AP

Fernald Environmental

FERMCO

Restoration Management Corporation

P.O. Box 398704 Cincinnati, Ohio 45239-8704 (513) 738-6200

4798

September 21, 1993

U. S. Department of Energy
Fernald Environmental Management Project
Letter No. C:RP:93-0161

Mr. Peter Sturdevant
Compliance Specialist
Hamilton County Department
of Environmental Services
Air Quality Management Division
1632 Central Parkway
Cincinnati, Ohio 45210

Dear Mr. Sturdevant:

RENEWAL OF PERMITS TO OPERATE - NINE STORAGE TANKS - AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (OEPA) NO. 1431110128 T062, T063, T064, T065, T066, T068, T069, T070, T071

Enclosed please find the renewal applications for the nine storage tanks at the FEMP. The Permits to Operate will expire on December 13, 1993 for three of the tanks, and on December 20, 1993 for the remaining six tanks. A check for $135.00 is enclosed to cover the application fee.

Please contact Mr. Bob Roulston of my staff at 738-6907 if you have any questions about this application.

Sincerely,

Kenneth L. Alkema
Vice President
Regulatory Programs

KLA:RKR:mhv
Attachments

0001

4798

Fernald Environmental
FERMCO
Restoration Management Corporation

cc: R. W. Bischoff, FERMCO, w/o attachments
S. M. Beckman, FERMCO, w/o attachments
Robert Mendelsohn, DOE Contract Specialist
W. J. Quaider, DOE-FN
R. K. Roulston, FERMCO, w/o attachments
P. B. Spotts, FERMCO, w/o attachments
AR Coordinator
PR Files (PTO T062, T063, T064, T065, T066, T068, T069, T070, T071)
File Record Storage Copy 108.6

RENEWAL APPLICATION FOR

PTO T062

4798

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

D.O.E.-Fernald Environmental Management Project
Facility Name

Mr. Stephen M. Beckman
Person to Contact

7400 Willey Road
Facility Address

Post Office Box 398704
Mailing Address

Fernald | Hamilton | 45030
City | County | Zip

Cincinnati | OH | 45239-8705
City | State | Zip

513/ 738-6502
Telephone Area Number

513/ 738-6502
Telephone

#1431110128-T062
(Application no., if this is a renewal application)

4953
Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

___Appendix A, Process
___Appendix B, Fuel-Burning Equipment
___Appendix C, Incinerator
___Appendix D, Surface Coating or Printing Operation
xx Appendix E, Storage Tank
___Appendix H, Gasoline Dispensing Facility
___Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
___Appendix K, Surface Coating Line or Printing Line
___Appendix L, Solvent Metal Cleaning
___ Appendix M, Fugitive Dust Emission Sources
_____ Specify Appendix No.
___Appendix N, Rubber Tire Manufacturing
___Appendix O, Dry Cleaning Facility
___Appendix P, Landfills
___Other Appendix _____
___Compliance Time Schedule

2. Description of Source (same as used on appendix): Tank 17C

3. Your identification for Source (same as used on appendix): 02-093

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

1) Appendix E
2) Emission Calculations

Stephen M. Beckman
Authorized Signature
for Kenneth L. Alkema
Vice President Regulatory Programs
Title

9/17/93
Date

0004

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

FOR OFFICIAL USE ONLY
Premise No.___/___/___/____
Source No.___/____
Application No.____/____

4798

DOE - FEMP
(Facility Name)
OEPA NO 1431110128 T062
FEMP ID NO. 02-093

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1. Tank identification: Name or number 17C (FEMP 2-093) EP2-084 Date Installed 1952 (month/year)
2. Tank capacity: 2,250 gallons
3. Tank shape: [X] Cylindrical [ ] Rectangular
   [ ] Spherical [ ] Other, specify_____
4. Tank dimensions: Diameter 8' Height 6' Length N/A Width N/A
5. Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Steel
6. Type of tank: [ ] External floating roof tank
   [ ] Internal floating roof tank
   [X] Fixed roof tank
   [ ] Vertical cylindrical tank
   [ ] Horizontal cylindrical tank
   [ ] Pressure tank
   [ ] Other, specify _____
7. Location of tank: [X] Outdoors [ ] Indoors [ ] Underground
8. Type of filling: [X] Splash [ ] Submerged [ ] Other, specify _____
9. If this tank is located outdoors and above ground, provide the paint color of the tank.
   N/A Tank is not painted - Stainless Steel
   [ ] Aluminum (specular) [ ] Light gray [ ] White
   [ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify _____
   Condition of paint: [ ] Good [ ] Poor
10. If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item. N/A

    a) Type of vapor control system _____
    Manufacturer _____ Make or model _____
    Date installed (month and year) _____

    b) Date tank was equipped with or vented to vapor control system (month & year) N/A
    c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled: _____
    (Attach calculations and test data to support response, unless previously submitted)

0005

4798

DOE - FEMP
(Facility Name)
17C (FEMP 2-093
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve. N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to vapor control, identify the vapor contro

12. Operational Data (complete (a) through (g) of this item for all materials stored or to stored. Attach additional sheets if necessary.)

a) Material Dirty Solvent (see note) Trade Name N/A
Density: 7.3 lbs/gal or _____° API Producer N/A

b) Temperature of stored material: Average AMB °F and Maximum AMB ° F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure is not known, write "unknown"):

i.) Actual vapor pressure: unknown psia at average storage temperature
unknown psia at maximum storage temperatu

ii.) Reid vapor pressure: Average _____ psi and minimum-maximum _____ - _____ psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: _____ psi gage at _____ °F

d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer question below.)

Is it a photochemically reactive material? [X] Yes [ ] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [ ] yes [ ] No
If yes, identify type (EPA hazardous waste number) _____

f) Indicate the year (or 12-month period) for item (g): 1983
g) Annual throughput of material: 18,750 gallons.

Completed by Robert K. Roulston, Jr. Date Aug. 30, 1993

NOTE: 75% Kerosene, 25% Tributyl Phosphate, trace Uranium content.

0006

Storage Tank
Emission Report
Tuesday, September 14 1993

---- Tank Characteristics ----

Identification

Identification No.:	17C/2-093
City:	Dayton
State:	Ohio
Company:	DOE-FEMP

Input Parameters

Type of Tank:	Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	6
Diameter (ft):	8
Liquid Height (ft):	6
Volume (gallons):	2250
Turnovers:	8
Net Throughput (gal/yr):	18750

Roof Characteristics

Roof Type:	Cone
Roof Height (ft):	0.000
Slope (ft/ft):	0.00000
Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition:	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00
Pressure Setting(psig):	0.00

---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Farenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Farenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Farenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.39
Alpha (Roof) =	0.39
Liquid Bulk Temperature (Degrees Farenheit) =	53.24
Average Liquid Surface Temperature (Degrees Farenheit) =	56.22
Daily Maximum Liquid Surface Temperature (Degrees Farenheit) =	62.84
Daily Minimum Liquid Surface Temperature (Degrees Farenheit) =	49.60
Daily Vapor Temperature Range =	26.49

4798

---- Storage Tank Vapor Pressure Information ----
Tuesday, September 14 1993
Storage Tank Emission Report

Speciation Option: None
Chemical Liquid: Kerosene

Vapor Pressure of total mixture =	0.041000
Minimum Vapor Pressure of total mixture =	0.041000
Maximum Vapor Pressure of total mixture =	0.041000
Vapor Molecular Weight of Mixture =	180.000000
Vapor pressure range =	0.000000

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0013
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.037217
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	18750
Liquid Volume (cubic feet) =	302
Turnovers =	8
Turnover Factor =	1.0000
Working Loss Product Factor =	1.00
Total Working Losses =	3.29

---- Storage Tank Total Losses (AP-42) ----
Total losses = 3.29 lb/year VOC

URANIUM EMISSIONS

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

(1) At typical tank pressures and temperatures, the vapor pressure of the Solvent is equal to that of Kerosene, the primary component of the solvent. TBP is a less volatile material, so this should provide a conservative estimate of vapor emissions.

(2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.

(3) Uranium emissions are determined by multiplying the amount of solvent lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.

(4) The emission factor was determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests. No similar testing has been conducted using this solvent; this is the best data available.

(5) Maximum emissions are five times the calculated annual emissions.

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{3.29 \text{ lb solvent}}{\text{year}} \left| \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb solvent}} \right| = 1.97E^{-08} \text{ lb U/year}$

Maximum Emissions: $1.97E^{-08}$ lb U/year x 5 = $9.87\ E^{-08}$ lb U/year

4798

RENEWAL APPLICATION FOR

PTO T063

0010

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

4798

D.O.E.-Fernald Environmental Management Project
Facility Name

Mr. Stephen M. Beckman
Person to Contact

7400 Willey Road
Facility Address

Post Office Box 398704
Mailing Address

Fernald | Hamilton | 45030
City | County | Zip

Cincinnati | OH | 45239-8705
City | State | Zip

513/ 738-6502
Telephone Area Number

513/ 738-6502
Telephone

#1431110128-T063
(Application no., if this is a renewal application)

4953
Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

___Appendix A, Process
___Appendix B, Fuel-Burning Equipment
___Appendix C, Incinerator
___Appendix D, Surface Coating or Printing Operation
xx Appendix E, Storage Tank
___Appendix H, Gasoline Dispensing Facility
___Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
___Appendix K, Surface Coating Line or Printing Line
___Appendix L, Solvent Metal Cleaning
___ Appendix M, Fugitive Dust Emission Sources
Specify Appendix No.
___Appendix N, Rubber Tire Manufacturing
___Appendix O, Dry Cleaning Facility
___Appendix P, Landfills
___Other Appendix
___Compliance Time Schedule

2. Description of Source (same as used on appendix): Tank 17B

3. Your identification for Source (same as used on appendix): 02-092

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

1) Appendix E
2) Emission Calculations

Stephen Beckman
for Authorized Signature*
Kenneth L. Alkema
Vice President Regulatory Programs
Title

9/17/93
Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

0011

E 4798

FOR OFFICIAL USE ONLY
Premise No.___/___/___/____
Source No.___/____
Application No._____/_____

DOE - FEMP
(Facility Name)
OEPA NO 1431110128 T0
FEMP ID NO. 02-0

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1. Tank identification: Name or number 17B (FEMP 2-092) EP2-083 Date Installed 1952 (month/year)
2. Tank capacity: 2,250 gallons
3. Tank shape: [X] Cylindrical [ ] Rectangular
   [ ] Spherical [ ] Other, specify_____
4. Tank dimensions: Diameter 8' Height 6' Length N/A Width N/A
5. Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Steel
6. Type of tank: [ ] External floating roof tank
   [ ] Internal floating roof tank
   [X] Fixed roof tank
   [ ] Vertical cylindrical tank
   [ ] Horizontal cylindrical tank
   [ ] Pressure tank
   [ ] Other, specify _____
7. Location of tank: [X] Outdoors [ ] Indoors [ ] Underground
8. Type of filling: [X] Splash [ ] Submerged [ ] Other, specify _____
9. If this tank is located outdoors and above ground, provide the paint color of the tank.
   N/A Tank is not painted; Stainless Steel
   [ ] Aluminum (specular) [ ] Light gray [ ] White
   [ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify _____
   Condition of paint: [ ] Good [ ] Poor
10. If this tank is equipped with or vented to a vapor control system, complete (a) through (of this item. N/A

    a) Type of vapor control system _____
    Manufacturer _____ Make or model _____
    Date installed (month and year) _____

    b) Date tank was equipped with or vented to vapor control system (month & year) N/A
    c) Specify the rate of emission or percent control (by weight) for any pollutants be controlled: _____
    (Attach calculations and test data to support response, unless previously submitted)

0012

DOE - FEMP 298
(Facility Name)
17B (FEMP 2-092)
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve. N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to a vapor control, identify the vapor control.

12. Operational Data (complete (a) through (g) of this item for all materials stored or to be stored. Attach additional sheets if necessary.)

a) Material Dirty Solvent (see note) Trade Name N/A
Density: 7.3 lbs/gal or _____° API Producer N/A

b) Temperature of stored material: Average AMB °F and Maximum AMB ° F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure is not known, write "unknown"):

i.) Actual vapor pressure: unknown psia at average storage temperature
unknown psia at maximum storage temperature

ii.) Reid vapor pressure: Average _____ psi and minimum-maximum _____ - _____ psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: _____ psi gage at _____ °F

d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer the question below.)

Is it a photochemically reactive material? [X] Yes [ ] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [ ] yes [ ] No
If yes, identify type (EPA hazardous waste number) _____

f) Indicate the year (or 12-month period) for item (g): 1983

g) Annual throughput of material: 18,750 gallons.

Completed by Robert K. Roulston, JR Date Aug. 30, 1993

NOTE: 75% Kerosene, 25% Tributyl Phosphate, trace Uranium content.

0013

4798

Storage Tank
Emission Report
Tuesday, September 14 1993

---- Tank Characteristics ----

Identification

Identification No.:	17B/2-092
City:	Dayton
State:	Ohio
Company:	DOE-FEMP

Input Parameters

Type of Tank:	Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	6
Diameter (ft):	8
Liquid Height (ft):	6
Volume (gallons):	2250
Turnovers:	8
Net Throughput (gal/yr):	18750

Roof Characteristics

Roof Type:	Cone
Roof Height (ft):	0.000
Slope (ft/ft):	0.00000
Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition:	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00
Pressure Setting(psig):	0.00

---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Farenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Farenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Farenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.39
Alpha (Roof) =	0.39
Liquid Bulk Temperature (Degrees Farenheit) =	53.24
Average Liquid Surface Temperature (Degrees Farenheit) =	56.22
Daily Maximum Liquid Surface Temperature (Degrees Farenheit) =	62.84
Daily Minimum Liquid Surface Temperature (Degrees Farenheit) =	49.60
Daily Vapor Temperature Range =	26.49

---- Storage Tank Vapor Pressure Information ----

Tuesday, September 14 1993
Storage Tank Emission Report

Speciation Option: None
Chemical Liquid: Kerosene

Vapor Pressure of total mixture =	0.041000
Minimum Vapor Pressure of total mixture =	0.041000
Maximum Vapor Pressure of total mixture =	0.041000
Vapor Molecular Weight of Mixture =	180.000000
Vapor pressure range =	0.000000

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0013
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.037217
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	18750
Liquid Volume (cubic feet) =	302
Turnovers =	8
Turnover Factor =	1.0000
Working Loss Product Factor =	1.00
Total Working Losses =	3.29

---- Storage Tank Total Losses (AP-42) ----
Total losses = 3.29 lbs/year VOC

4798

URANIUM EMISSIONS

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

(1) At typical tank pressures and temperatures, the vapor pressure of the solvent is equal to that of Kerosene, the primary component of the solvent. TBP is a less volatile material, so this should provide a conservative estimate of vapor emissions.

(2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.

(3) Uranium emissions are determined by multiplying the amount of solvent lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.

(4) The emission factor was determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests. No similar testing has been conducted using this solvent; this is the best data available.

(5) Maximum emissions are five times the calculated annual emissions.

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{3.29 \text{ lb solvent}}{\text{year}} \left| \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb solvent}} \right| = 1.97E^{-08}$ lb U/year

Maximum Emissions: $1.97E^{-08}$ lb U/year x 5 = $9.87\ E^{-08}$ lb U/year

A798

RENEWAL APPLICATION FOR

PTO T064

0017

4798

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE

D.O.E.-Fernald Environmental Management Project
Facility Name

Mr. Stephen M. Beckman
Person to Contact

7400 Willey Road
Facility Address

Post Office Box 398704
Mailing Address

Fernald | Hamilton | 45030
City | County | Zip

Cincinnati | OH | 45239-8705
City | State | Zip

513/ 738-6502
Telephone Area Number

513/ 738-6502
Telephone

#1431110128-T064
(Application no., if this is a renewal application)

4953
Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

___Appendix A, Process
___Appendix B, Fuel-Burning Equipment
___Appendix C, Incinerator
___Appendix D, Surface Coating or Printing Operation
xx Appendix E, Storage Tank
___Appendix H, Gasoline Dispensing Facility
___Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
___Appendix K, Surface Coating Line or Printing Line
___Appendix L, Solvent Metal Cleaning
___ Appendix M, Fugitive Dust Emission Sources
Specify Appendix No.
___Appendix N, Rubber Tire Manufacturing
___Appendix O, Dry Cleaning Facility
___Appendix P, Landfills
___Other Appendix
___Compliance Time Schedule

2. Description of Source (same as used on appendix): Tank 17A

3. Your identification for Source (same as used on appendix): 02-091

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

1) Appendix E
2) Emission Calculations

Stephen M. Beckman
Authorized Signature*
for Kenneth L. Alkema
Vice President Regulatory Programs
Title

9/17/93
Date

0018

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

FOR OFFICIAL USE ONLY
Premise No.___/___/___/____
Source No.___/____
Application No.____/____

4798
DOE - FEMP
(Facility Name)
OEPA NO 1431110128 T064
FEMP ID NO. 02-091

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1. Tank identification: Name or number 17A (FEMP 2-091) EP2-082 Date Installed 1952 (month/year)

2. Tank capacity: 2,250 gallons

3. Tank shape: [X] Cylindrical [ ] Rectangular
[ ] Spherical [ ] Other, specify _____
4. Tank dimensions: Diameter 8' Height 6' Length N/A Width N/A
5. Tank shell material: [ ] Steel [ ] Aluminum [x] Other, specify Stainless Steel
6. Type of tank: [ ] External floating roof tank
[ ] Internal floating roof tank
[X] Fixed roof tank
[ ] Vertical cylindrical tank
[ ] Horizontal cylindrical tank
[ ] Pressure tank
[ ] Other, specify _____
7. Location of tank: [X] Outdoors [ ] Indoors [ ] Underground

8. Type of filling: [X] Splash [ ] Submerged [ ] Other, specify _____
9. If this tank is located outdoors and above ground, provide the paint color of the tank.
N/A Tank is not painted; Stainless Steel
[ ] Aluminum (specular) [ ] Light gray [ ] White
[ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify _____
Condition of paint: [ ] Good [ ] Poor

10. If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item. N/A

a) Type of vapor control system _____
Manufacturer _____ Make or model _____
Date installed (month and year) _____

b) Date tank was equipped with or vented to vapor control system (month & year) N/A
c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled: _____
(Attach calculations and test data to support response, unless previously submitted)

0019

4798

DOE - FEMP
(Facility Name)
17A (FEMP 2-091)
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve. N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to a vapor control, identify the vapor control.

12. Operational Data (complete (a) through (g) of this item for all materials stored or to be stored. Attach additional sheets if necessary.)

a) Material Dirty Solvent (see note) Trade Name N/A
Density: 7.3 lbs/gal or _____ ° API Producer N/A
b) Temperature of stored material: Average AMB °F and Maximum AMB ° F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure is not known, write "unknown"):

i.) Actual vapor pressure: unknown psia at average storage temperature
unknown psia at maximum storage temperature

ii.) Reid vapor pressure: Average _____ psi and minimum-maximum _____ - _____ psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: _____ psi gage at _____ °F

d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer the question below.)

Is it a photochemically reactive material? [X] Yes [ ] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [ ] yes [ ] No
If yes, identify type (EPA hazardous waste number) _____
f) Indicate the year (or 12-month period) for item (g): 1983
g) Annual throughput of material: 18,750 gallons.

Completed by Robert K. Roulston, Jr. Date Aug. 30, 1993

NOTE: 75% Kerosene, 25% Tributyl Phosphate, trace Uranium content.

0020

E 4798

Storage Tank
Emission Report
Tuesday, September 14 1993

---- Tank Characteristics ----

Identification

Identification No.:	17A/2-091
City:	Dayton
State:	Ohio
Company:	DOE-FEMP

Input Parameters

Type of Tank:	Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	6
Diameter (ft):	8
Liquid Height (ft):	6
Volume (gallons):	2250
Turnovers:	8
Net Throughput (gal/yr):	18750

Roof Characteristics

Roof Type:	Cone
Roof Height (ft):	0.000
Slope (ft/ft):	0.00000
Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition:	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00
Pressure Setting(psig):	0.00

---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Farenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Farenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Farenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.39
Alpha (Roof) =	0.39
Liquid Bulk Temperature (Degrees Farenheit) =	53.24
Average Liquid Surface Temperature (Degrees Farenheit) =	56.22
Daily Maximum Liquid Surface Temperature (Degrees Farenheit) =	62.84
Daily Minimum Liquid Surface Temperature (Degrees Farenheit) =	49.60
Daily Vapor Temperature Range =	26.49

4798

---- Storage Tank Vapor Pressure Information ----

Tuesday, September 14 1993
Storage Tank Emission Report
Page 2

Speciation Option: None
Chemical Liquid: Kerosene

Vapor Pressure of total mixture =	0.041000
Minimum Vapor Pressure of total mixture =	0.041000
Maximum Vapor Pressure of total mixture =	0.041000
Vapor Molecular Weight of Mixture =	180.000000
Vapor pressure range =	0.000000

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0013
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.037217
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	18750
Liquid Volume (cubic feet) =	302
Turnovers =	8
Turnover Factor =	1.0000
Working Loss Product Factor =	1.00
Total Working Losses =	3.29

---- Storage Tank Total Losses (AP-42) ----
Total losses = 3.29 lbs/year VOC

0022

URANIUM EMISSIONS

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

(1) At typical tank pressures and temperatures, the vapor pressure of the solvent is equal to that of Kerosene, the primary component of the solvent. TBP is a less volatile material, so this should provide a conservative estimate of vapor emissions.

(2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.

(3) Uranium emissions are determined by multiplying the amount of solvent lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.

(4) The emission factor was determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests. No similar testing has been conducted using this solvent; this is the best data available.

(5) Maximum emissions are five times the calculated annual emissions.

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{3.29 \text{ lb solvent}}{\text{year}} \left| \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb solvent}} \right| = 1.97E^{-08}$ lb U/year

Maximum Emissions: $1.97E^{-08}$ lb U/year x 5 = $9.87\ E^{-08}$ lb U/year

4798

RENEWAL APPLICATION FOR

PTO T065

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

4798

D.O.E.-Fernald Environmental Management Project
Facility Name

Mr. Stephen M. Beckman
Person to Contact

7400 Willey Road
Facility Address

Post Office Box 398704
Mailing Address

Fernald — Hamilton — 45030
City — County — Zip

Cincinnati — OH — 45239-8705
City — State — Zip

513/ 738-6502
Telephone — Area — Number

513/ 738-6502
Telephone

#1431110128-T065
(Application no., if this is a renewal application)

4953
Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

___Appendix A, Process
___Appendix B, Fuel-Burning Equipment
___Appendix C, Incinerator
___Appendix D, Surface Coating or Printing Operation
xx Appendix E, Storage Tank
___Appendix H, Gasoline Dispensing Facility
___Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
___Appendix K, Surface Coating Line or Printing Line
___Appendix L, Solvent Metal Cleaning
___ Appendix M, Fugitive Dust Emission Sources
Specify Appendix No.
___Appendix N, Rubber Tire Manufacturing
___Appendix O, Dry Cleaning Facility
___Appendix P, Landfills
___Other Appendix
___Compliance Time Schedule

2. Description of Source (same as used on appendix): Tank 5B

3. Your identification for Source (same as used on appendix): 02-090

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

1) Appendix E
2) Emission Calculations

Stephen M. Beckman
Authorized Signature*
for Kenneth L. Alkema
Vice President Regulatory Programs
Title

9/17/93
Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

0025

FOR OFFICIAL USE ONLY 4798
Premise No.___/___/___/____
Source No.___/____
Application No._____/_____

DOE - FEMP
(Facility Name)
OEPA NO 1431110128 TO
FEMP ID NO. 02-0

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1. Tank identification: Name or number 5B (FEMP 2-090) EP2-081 Date Installed 1952 (month/year)

2. Tank capacity: 2,600 gallons

3. Tank shape: [X] Cylindrical [ ] Rectangular
[ ] Spherical [ ] Other, specify _____

4. Tank dimensions: Diameter 8' Height 7' Length N/A Width N/A

5. Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Steel

6. Type of tank: [ ] External floating roof tank
[ ] Internal floating roof tank
[X] Fixed roof tank
[ ] Vertical cylindrical tank
[ ] Horizontal cylindrical tank
[ ] Pressure tank
[ ] Other, specify _____

7. Location of tank: [X] Outdoors [ ] Indoors [ ] Underground

8. Type of filling: [X] Splash [ ] Submerged [ ] Other, specify _____

9. If this tank is located outdoors and above ground, provide the paint color of the tank. N
Stainless steel w/galvanized steel jacket
[ ] Aluminum (specular) [ ] Light gray [ ] White
[ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify _____
Condition of paint: [ ] Good [ ] Poor N/A

10. If this tank is equipped with or vented to a vapor control system, complete (a) through of this item. N/A

a) Type of vapor control system _____
Manufacturer _____ Make or model _____
Date installed (month and year) _____

b) Date tank was equipped with or vented to vapor control system (month & year) N/A
c) Specify the rate of emission or percent control (by weight) for any pollutants be controlled: _____
(Attach calculations and test data to support response, unless previously submitted)

0026

4798

DOE - FEMP
(Facility Name)
5B (FEMP 2-090)
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve. N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to a vapor control, identify the vapor control.

12. Operational Data (complete (a) through (g) of this item for all materials stored or to be stored. Attach additional sheets if necessary.)

a) Material Solvent (see note) Trade Name N/A
Density: 7.3 lbs/gal or _____ ° API Producer N/A

b) Temperature of stored material: Average AMB °F and Maximum AMB ° F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure is not known, write "unknown"):

i.) Actual vapor pressure: unknown psia at average storage temperature
unknown psia at maximum storage temperature

ii.) Reid vapor pressure: Average _____ psi and minimum-maximum _____ - _____ psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: _____ psi gage at _____ °F

d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer the question below.)

Is it a photochemically reactive material? [X] Yes [ ] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [ ] yes [ ] No
If yes, identify type (EPA hazardous waste number) _____

f) Indicate the year (or 12-month period) for item (g): 1983

g) Annual throughput of material: 325,000 gallons.

Completed by Robert K. Roulston, Jr. Date Aug. 30, 1993

NOTE: 75% kerosene, 25% tributyl phosphate, trace uranium content.

0027

Storage Tank
Emission Report
Tuesday, September 14 1993

---- Tank Characteristics ----

Identification

Identification No.:	5B/2-090
City:	Dayton
State:	Ohio
Company:	FEMP-DOE

Input Parameters

Type of Tank:	Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	7
Diameter (ft):	8
Liquid Height (ft):	7
Volume (gallons):	2600
Turnovers:	125
Net Throughput (gal/yr):	325000

Roof Characteristics

Roof Type:	Cone
Roof Height (ft):	0.000
Slope (ft/ft):	0.00000
Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition:	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00
Pressure Setting(psig):	0.00

---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Farenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Farenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Farenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.39
Alpha (Roof) =	0.39
Liquid Bulk Temperature (Degrees Farenheit) =	53.24
Average Liquid Surface Temperature (Degrees Farenheit) =	56.22
Daily Maximum Liquid Surface Temperature (Degrees Farenheit) =	62.84
Daily Minimum Liquid Surface Temperature (Degrees Farenheit) =	49.60
Daily Vapor Temperature Range =	26.49

---- Storage Tank Vapor Pressure Information ----

Tuesday, September 14 1993
Storage Tank Emission Report
Page 2

Speciation Option: None
Chemical Liquid: Kerosene

Vapor Pressure of total mixture =	0.041000
Minimum Vapor Pressure of total mixture =	0.041000
Maximum Vapor Pressure of total mixture =	0.041000
Vapor Molecular Weight of Mixture =	180.000000
Vapor pressure range =	0.000000

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0013
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.037217
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	325000
Liquid Volume (cubic feet) =	352
Turnovers =	123
Turnover Factor =	0.4097
Working Loss Product Factor =	1.00
Total Working Losses =	23.39

---- Storage Tank Total Losses (AP-42) ----
Total losses = 23.39 lbs/year VOC

URANIUM EMISSIONS

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

(1) At typical tank pressures and temperatures, the vapor pressure of the Solvent is equal to that of Kerosene, the primary component of the solvent. TBP is a less volatile material, so this should provide a conservative estimate of vapor emissions.

(2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.

(3) Uranium emissions are determined by multiplying the amount of solvent lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.

(4) The emission factor was determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests. No similar testing has been conducted using this solvent; this is the best data available.

(5) Maximum emissions are five times the calculated annual emissions.

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{23.39 \text{ lb solvent}}{\text{year}} \left| \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb solvent}} \right| = 1.40E^{-07}$ lb U/year

Maximum Emissions: $1.40\ E^{-08}$ lb U/year x 5 = $7.00\ E^{-07}$ lb U/year

4798

RENEWAL APPLICATION FOR

PTO T066

4798

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE

D.O.E.-Fernald Environmental Management Project
Facility Name

Mr. Stephen M. Beckman
Person to Contact

7400 Willey Road
Facility Address

Post Office Box 398704
Mailing Address

Fernald | Hamilton | 45030
City | County | Zip

Cincinnati | OH | 45239-8705
City | State | Zip

513/ 738-6502
Telephone Area Number

513/ 738-6502
Telephone

#1431110128-T066
(Application no., if this is a renewal application)

4953
Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

___Appendix A, Process
___Appendix B, Fuel-Burning Equipment
___Appendix C, Incinerator
___Appendix D, Surface Coating or Printing Operation
xx Appendix E, Storage Tank
___Appendix H, Gasoline Dispensing Facility
___Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
___Appendix K, Surface Coating Line or Printing Line
___Appendix L, Solvent Metal Cleaning
___ Appendix M, Fugitive Dust Emission Sources
Specify Appendix No.
___Appendix N, Rubber Tire Manufacturing
___Appendix O, Dry Cleaning Facility
___Appendix P, Landfills
___Other Appendix
___Compliance Time Schedule

2. Description of Source (same as used on appendix): Tank 5A

3. Your identification for Source (same as used on appendix): 02-089

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

1) Appendix E
2) Emission Calculations

Stephen M. Beckman
Authorized Signature*
for Kenneth L. Alkema
Vice President Regulatory Programs
Title

9/17/93
Date

0032

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

FOR OFFICIAL USE ONLY
Premise No.___/___/___/____
Source No.___/____
Application No._____/_____

4798

DOE - FEMP
(Facility Name)
OEPA NO 1431110128 T066
FEMP ID NO. 02-089

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1. Tank identification: Name or number 5A (FEMP 2-089) EP2-080 Date Installed 1952 (month/year)
2. Tank capacity: 2,600 gallons
3. Tank shape: [X] Cylindrical [ ] Rectangular [ ] Spherical [ ] Other, specify_____
4. Tank dimensions: Diameter 8' Height 7' Length N/A Width N/A
5. Tank shell material: [ ] Steel [ ] Aluminum [ ] Other, specify Stainless Steel
6. Type of tank: [ ] External floating roof tank
   [ ] Internal floating roof tank
   [X] Fixed roof tank
   [ ] Vertical cylindrical tank
   [ ] Horizontal cylindrical tank
   [ ] Pressure tank
   [ ] Other, specify _____
7. Location of tank: [X] Outdoors [ ] Indoors [ ] Underground
8. Type of filling: [X] Splash [ ] Submerged [ ] Other, specify _____
9. If this tank is located outdoors and above ground, provide the paint color of the tank. N/A: Stainless steel w/galvanized steel jacket
   [ ] Aluminum (specular) [ ] Light gray [ ] White
   [ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify _____
   Condition of paint: [ ] Good [ ] Poor N/A
10. If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item. N/A

    a) Type of vapor control system _____
    Manufacturer _____ Make or model _____
    Date installed (month and year) _____

    b) Date tank was equipped with or vented to vapor control system (month & year) N/A
    c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled: _____
    (Attach calculations and test data to support response, unless previously submitted)

0033

4798

DOE - FEMP
(Facility Name)
5A (FEMP 2-089)
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve. N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to vapor control, identify the vapor contro

12. Operational Data (complete (a) through (g) of this item for all materials stored or to stored. Attach additional sheets if necessary.)

a) Material Solvent (see note) Trade Name N/A
Density: 7.3 lbs/gal or _____° API Producer N/A

b) Temperature of stored material: Average AMB °F and Maximum AMB ° F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressu is not known, write "unknown"):

i.) Actual vapor pressure: Unknown psia at average storage temperature
Unknown psia at maximum storage temperatu

ii.) Reid vapor pressure: Average _____ psi and minimum-maximum _____ - _____ psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: _____ psi gage at _____ °F

d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer question below.)

Is it a photochemically reactive material? [X] Yes [ ] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [ ] yes [ ] No
If yes, identify type (EPA hazardous waste number) _____

f) Indicate the year (or 12-month period) for item (g): 1983

g) Annual throughput of material: 325,000 gallons.

Completed by Robert K. Roulston, Jr. Date Aug. 30, 1993

NOTE: 75% kerosene, 25% tributyl phosphate, trace uranium content.

0034

Storage Tank
Emission Report
Tuesday, September 14 1993

---- Tank Characteristics ----

Identification

Identification No.:	5A/2-089
City:	Dayton
State:	Ohio
Company:	DOE-FEMP

Input Parameters

Type of Tank:	Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	7
Diameter (ft):	8
Liquid Height (ft):	7
Volume (gallons):	2600
Turnovers:	125
Net Throughput (gal/yr):	325000

Roof Characteristics

Roof Type:	Cone
Roof Height (ft):	0.000
Slope (ft/ft):	0.00000
Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition:	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00
Pressure Setting(psig):	0.00

---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Farenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Farenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Farenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.39
Alpha (Roof) =	0.39
Liquid Bulk Temperature (Degrees Farenheit) =	53.24
Average Liquid Surface Temperature (Degrees Farenheit) =	56.22
Daily Maximum Liquid Surface Temperature (Degrees Farenheit) =	62.84
Daily Minimum Liquid Surface Temperature (Degrees Farenheit) =	49.60
Daily Vapor Temperature Range =	26.49

4790

---- Storage Tank Vapor Pressure Information ----

Tuesday, September 14 1993
Storage Tank Emission Report
Page 2

Speciation Option: None
Chemical Liquid: Kerosene

Vapor Pressure of total mixture =	0.041000
Minimum Vapor Pressure of total mixture =	0.041000
Maximum Vapor Pressure of total mixture =	0.041000
Vapor Molecular Weight of Mixture =	180.000000
Vapor pressure range =	0.000000

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0013
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.037217
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	325000
Liquid Volume (cubic feet) =	352
Turnovers =	123
Turnover Factor =	0.4097
Working Loss Product Factor =	1.00
Total Working Losses =	23.39

---- Storage Tank Total Losses (AP-42) ----
Total losses = 23.39 lbs/year VOC

0036

URANIUM EMISSIONS

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

(1) At typical tank pressures and temperatures, the vapor pressure of the Solvent is equal to that of Kerosene, the primary component of the solvent. TBP is a less volatile material, so this should provide a conservative estimate of vapor emissions.

(2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.

(3) Uranium emissions are determined by multiplying the amount of solvent lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.

(4) The emission factor was determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests. No similar testing has been conducted using this solvent; this is the best data available.

(5) Maximum emissions are five times the calculated annual emissions.

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{23.39 \text{ lb solvent}}{\text{year}} \left| \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb solvent}} \right| = 1.40\ E^{-07}$ lb U/year

Maximum Emissions: $1.40\ E^{-07}$ lb U/year x 5 = $7.00\ E^{-07}$ lb U/year

4798

RENEWAL APPLICATION FOR

PTO T068

0038

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

4798

D.O.E.-Fernald Environmental Management Project
Facility Name

Mr. Stephen M. Beckman
Person to Contact

7400 Willey Road
Facility Address

Post Office Box 398704
Mailing Address

Fernald | Hamilton | 45030
City | County | Zip

Cincinnati | OH | 45239-8705
City | State | Zip

513/ 738-6502
Telephone Area Number

513/ 738-6502
Telephone

#1431110128-T068
(Application no., if this is a renewal application)

4953
Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

___Appendix A, Process
___Appendix B, Fuel-Burning Equipment
___Appendix C, Incinerator
___Appendix D, Surface Coating or Printing Operation
xx Appendix E, Storage Tank
___Appendix H, Gasoline Dispensing Facility
___Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
___Appendix K, Surface Coating Line or Printing Line
___Appendix L, Solvent Metal Cleaning
___ Appendix M, Fugitive Dust Emission Sources
_____ Specify Appendix No.
___Appendix N, Rubber Tire Manufacturing
___Appendix O, Dry Cleaning Facility
___Appendix P, Landfills
___Other Appendix _____
___Compliance Time Schedule

2. Description of Source (same as used on appendix): Tank F1-512

3. Your identification for Source (same as used on appendix): 02-094

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

1) Appendix E
2) Emission Calculations

Stephen M. Beckman
Authorized Signature*
for Kenneth L. Alkema
Vice President Regulatory Programs
Title

9/17/93
Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

0039

E 4798

FOR OFFICIAL USE ONLY
Premise No.___/___/___/____
Source No.___/____
Application No._____/_____

DOE - FEMP
(Facility Name)
OEPA NO 1431110128 TO
FEMP ID NO. 02-0

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1. Tank identification: Name or number FI-512 (FEMP 2-094) Date Installed 1952 (month/year)
2. Tank capacity: 25,600 gallons
3. Tank shape: [X] Cylindrical [ ] Rectangular
   [ ] Spherical [ ] Other, specify_____
4. Tank dimensions: Diameter 8'6" Height 60 Length N/A Width N/A
5. Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Steel
6. Type of tank: [ ] External floating roof tank
   [ ] Internal floating roof tank
   [X] Fixed roof tank
   [ ] Vertical cylindrical tank
   [ ] Horizontal cylindrical tank
   [ ] Pressure tank
   [ ] Other, specify _____
7. Location of tank: [X] Outdoors [ ] Indoors [ ] Underground
8. Type of filling: [X] Splash [ ] Submerged [ ] Other, specify _____
9. If this tank is located outdoors and above ground, provide the paint color of the tank.
   N/A Tank is not painted; stainless steel
   [ ] Aluminum (specular) [ ] Light gray [ ] White
   [ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify _____
   Condition of paint: [ ] Good [ ] Poor
10. If this tank is equipped with or vented to a vapor control system, complete (a) through of this item. N/A

    a) Type of vapor control system _____
    Manufacturer _____ Make or model _____
    Date installed (month and year) _____

    b) Date tank was equipped with or vented to vapor control system (month & year) N/A
    c) Specify the rate of emission or percent control (by weight) for any pollutants be controlled: _____
    (Attach calculations and test data to support response, unless previously submitted)

0040

DOE - FEMP
(Facility Name)
F1-512 (FEMP 2-094)
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve. N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to a vapor control, identify the vapor control.

12. Operational Data (complete (a) through (g) of this item for all materials stored or to be stored. Attach additional sheets if necessary.)

a) Material Solvent (see note) Trade Name N/A
Density: 7.3 lbs/gal or ____° API Producer N/A

b) Temperature of stored material: Average AMB °F and Maximum AMB ° F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure is not known, write "unknown"):

i.) Actual vapor pressure: Unknown psia at average storage temperature
Unknown psia at maximum storage temperature

ii.) Reid vapor pressure: Average ____ psi and minimum-maximum ____ - ____ psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: ____ psi gage at ____ °F

d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer the question below.)

Is it a photochemically reactive material? [X] Yes [ ] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [ ] yes [ ] No
If yes, identify type (EPA hazardous waste number) ____

f) Indicate the year (or 12-month period) for item (g): 1983

g) Annual throughput of material: 250,000 gallons.

Completed by Robert K. Roulston, Jr. Date Aug. 30, 1993

NOTE: 75% Kerosene, 25% Tributyl Phosphate, trace Uranium content.

0041

4798

Storage Tank
Emission Report
Tuesday, September 14 1993

---- Tank Characteristics ----

Identification

Identification No.:	F1-512
City:	Dayton
State:	Ohio
Company:	DOE-FEMP

Input Parameters

Type of Tank:	Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	60
Diameter (ft):	9
Liquid Height (ft):	60
Volume (gallons):	25600
Turnovers:	10
Net Throughput (gal/yr):	250000

Roof Characteristics

Roof Type:	Cone
Roof Height (ft):	0.000
Slope (ft/ft):	0.00000
Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition:	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00
Pressure Setting(psig):	0.00

---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Farenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Farenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Farenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.39
Alpha (Roof) =	0.39
Liquid Bulk Temperature (Degrees Farenheit) =	53.24
Average Liquid Surface Temperature (Degrees Farenheit) =	56.22
Daily Maximum Liquid Surface Temperature (Degrees Farenheit) =	62.84
Daily Minimum Liquid Surface Temperature (Degrees Farenheit) =	49.60
Daily Vapor Temperature Range =	26.49

0042

---- Storage Tank Vapor Pressure Information ----

Tuesday, September 14 1993
Storage Tank Emission Report
Page 2

Speciation Option: None
Chemical Liquid: Kerosene

Vapor Pressure of total mixture =	0.041000
Minimum Vapor Pressure of total mixture =	0.041000
Maximum Vapor Pressure of total mixture =	0.041000
Vapor Molecular Weight of Mixture =	180.000000
Vapor pressure range =	0.000000

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0013
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.037217
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	250000
Liquid Volume (cubic feet) =	3817
Turnovers =	9
Turnover Factor =	1.0000
Working Loss Product Factor =	1.00
Total Working Losses =	43.93

---- Storage Tank Total Losses (AP-42) ----
Total losses = 43.93 lbs/year VOC

URANIUM EMISSIONS

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

(1) At typical tank pressures and temperatures, the vapor pressure of the solvent is equal to that of Kerosene, the primary component of the solvent. TBP is a less volatile material, so this should provide a conservative estimate of vapor emissions.

(2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.

(3) Uranium emissions are determined by multiplying the amount of solvent lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.

(4) The emission factor was determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests. No similar testing has been conducted using this solvent; this is the best data available.

(5) Maximum emissions are five times the calculated annual emissions.

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{43.93 \text{ lb solvent}}{\text{year}} \left| \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb solvent}} \right| = 2.64E^{-07}$ lb U/year

Maximum Emissions: $2.64E^{-07}$ lb U/year x 5 = $1.32E^{-06}$ lb U/year

4798

RENEWAL APPLICATION FOR

PTO T069

0045

4798

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE

D.O.E.-Fernald Environmental Management Project Facility Name	Mr. Stephen M. Beckman Person to Contact
7400 Willey Road Facility Address	Post Office Box 398704 Mailing Address
Fernald Hamilton 45030 City County Zip	Cincinnati OH 45239-8705 City State Zip
513/ 738-6502 Telephone Area Number	513/ 738-6502 Telephone
#1431110128-T069 (Application no., if this is a renewal application)	4953 Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

___Appendix A, Process
___Appendix B, Fuel-Burning Equipment
___Appendix C, Incinerator
___Appendix D, Surface Coating or Printing Operation
xx Appendix E, Storage Tank
___Appendix H, Gasoline Dispensing Facility
___Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
___Appendix K, Surface Coating Line or Printing Line
___Appendix L, Solvent Metal Cleaning
___ Appendix M, Fugitive Dust Emission Sources
_____ Specify Appendix No.
___Appendix N, Rubber Tire Manufacturing
___Appendix O, Dry Cleaning Facility
___Appendix P, Landfills
___Other Appendix _____
___Compliance Time Schedule

2. Description of Source (same as used on appendix): Tank F3E-222

3. Your identification for Source (same as used on appendix): 02-097

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

1) Appendix E
2) Emission Calculations

Stephen M. Beckman
Authorized Signature
for Kenneth L. Alkema
Vice President Regulatory Programs
Title

9/17/93
Date

46

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

FOR OFFICIAL USE ONLY
Premise No.___/___/___/____
Source No.___/____
Application No._____/_____

4798

DOE - FEMP
(Facility Name)
OEPA NO 1431110128 T069
FEMP ID NO. 02-097

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1. Tank identification: Name or number F3E-222 (FEMP 2-097) EP2-088 Date Installed 1952 (month/year)

2. Tank capacity: 30,000 gallons

3. Tank shape: [X] Cylindrical [ ] Rectangular
[ ] Spherical [ ] Other, specify _____

4. Tank dimensions: Diameter 15'6" Height 21' Length N/A Width N/A

5. Tank shell material: [ ] Steel [ ] Aluminum [ ] Other, specify Stainless Steel

6. Type of tank: [ ] External floating roof tank
[ ] Internal floating roof tank
[X] Fixed roof tank
[ ] Vertical cylindrical tank
[ ] Horizontal cylindrical tank
[ ] Pressure tank
[ ] Other, specify _____

7. Location of tank: [X] Outdoors [ ] Indoors [ ] Underground

8. Type of filling: [X] Splash [ ] Submerged [ ] Other, specify _____

9. If this tank is located outdoors and above ground, provide the paint color of the tank. N/A: Stainless steel w/galvanized steel jacket
[ ] Aluminum (specular) [ ] Light gray [ ] White
[ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify _____
Condition of paint: [ ] Good [ ] Poor N/A

10. If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item. N/A

a) Type of vapor control system _____
Manufacturer _____ Make or model _____
Date installed (month and year) _____

b) Date tank was equipped with or vented to vapor control system (month & year) N/A
c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled: _____
(Attach calculations and test data to support response, unless previously submitted)

0047

4798

DOE - FEMP
(Facility Name)
F3E-222 (FEMP 2-097
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve. N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to vapor control, identify the vapor contro

12. Operational Data (complete (a) through (g) of this item for all materials stored or to stored. Attach additional sheets if necessary.)

a) Material Uranyl Nitrate Trade Name N/A
Density: 9.5 lbs/gal or _____° API Producer N/A

b) Temperature of stored material: Average AMB °F and Maximum AMB ° F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor press is not known, write "unknown"):

i.) Actual vapor pressure: 0.46 psia at average storage temperature
(Aqueous Solution - 0.46 psia at maximum storage temperatu
essentially water)

ii.) Reid vapor pressure: Average _____ psi and minimum-maximum _____ - _____ psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: _____ psi gage at _____ °F

d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer question below.)

Is it a photochemically reactive material? [ ] Yes [X] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [ ] yes [ ] No
If yes, identify type (EPA hazardous waste number) _____

f) Indicate the year (or 12-month period) for item (g): 1983

g) Annual throughput of material: 3,750,000 gallons.

Completed by Robert K. Roulston, Jr. Date Aug. 30, 1993

0048

Storage Tank
Emission Report
Thursday, September 16 1993

---- Tank Characteristics ----

Identification

Identification No.:	F3E-222
City:	Dayton
State:	Ohio
Company:	DOE-FEMP

Input Parameters

Type of Tank:	Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	21
Diameter (ft):	15
Liquid Height (ft):	21
Volume (gallons):	27763
Turnovers:	125
Net Throughput (gal/yr):	3750000

Roof Characteristics

Roof Type:	Cone
Roof Height (ft):	0.000
Slope (ft/ft):	0.00000
Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition:	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00
Pressure Setting(psig):	0.00

---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Farenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Farenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Farenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.39
Alpha (Roof) =	0.39
Liquid Bulk Temperature (Degrees Farenheit) =	53.24
Average Liquid Surface Temperature (Degrees Farenheit) =	56.22
Daily Maximum Liquid Surface Temperature (Degrees Farenheit) =	62.84
Daily Minimum Liquid Surface Temperature (Degrees Farenheit) =	49.60
Daily Vapor Temperature Range =	26.49

---- Storage Tank Vapor Pressure Information ----

Thursday, September 16 1993
Storage Tank Emission Report
Page 2

Speciation Option: None
Chemical Liquid: Uranyl Nitrate

Vapor Pressure of total mixture =	0.227238
Minimum Vapor Pressure of total mixture =	0.175816
Maximum Vapor Pressure of total mixture =	0.287205
Vapor Molecular Weight of Mixture =	18.000000
Vapor pressure range =	0.111389

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0007
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.044914
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	3750000
Liquid Volume (cubic feet) =	3711
Turnovers =	135
Turnover Factor =	0.3888
Working Loss Product Factor =	1.00
Total Working Losses =	141.98

---- Storage Tank Total Losses (AP-42) ----
Total losses = 141.98 lbs/year Water Vapor

URANIUM EMISSIONS

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

(1) At typical tank pressures and temperatures, the vapor pressure of the Uranyl Nitrate solution is equal to that of water.

(2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.

(3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.

(4) The emission factor has been determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.

(5) Maximum emissions are five times the calculated annual emissions.

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{141.98 \text{ lb water}}{\text{year}} \left| \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb water}} \right| = 8.52E^{-07}$ lb U/year

Maxumum Emissions: $8.52E^{-07}$ lb U/year x 5 = $4.26E^{-06}$ lb U/year

4798

RENEWAL APPLICATION FOR

PTO T070

1152

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

4798

D.O.E.-Fernald Environmental Management Project
Facility Name

Mr. Stephen M. Beckman
Person to Contact

7400 Willey Road
Facility Address

Post Office Box 398704
Mailing Address

Fernald | Hamilton | 45030
City | County | Zip

Cincinnati | OH | 45239-8705
City | State | Zip

513/ 738-6502
Telephone Area Number

513/ 738-6502
Telephone

#1431110128-T070
(Application no., if this is a renewal application)

4953
Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

___Appendix A, Process
___Appendix B, Fuel-Burning Equipment
___Appendix C, Incinerator
___Appendix D, Surface Coating or Printing Operation
xx Appendix E, Storage Tank
___Appendix H, Gasoline Dispensing Facility
___Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
___Appendix K, Surface Coating Line or Printing Line
___Appendix L, Solvent Metal Cleaning
___ Appendix M, Fugitive Dust Emission Sources
_____ Specify Appendix No.
___Appendix N, Rubber Tire Manufacturing
___Appendix O, Dry Cleaning Facility
___Appendix P, Landfills
___Other Appendix _____
___Compliance Time Schedule

2. Description of Source (same as used on appendix): Tank F3E-223

3. Your identification for Source (same as used on appendix): 02-098

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

1) Appendix E
2) Emission Calculations

for Authorized Signature*
Kenneth L. Alkema
Vice President Regulatory Programs
Title

9/17/93
Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

0053

4798

FOR OFFICIAL USE ONLY

Premise No.___/___/___/____
Source No.___/____
Application No._____/_____

DOE - FEMP
(Facility Name)
OEPA NO 1431110128 TO
FEMP ID NO. 02-0

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1. Tank identification: Name or number F3E-223 (FEMP 2-098) EP2-089 Date Installed 1952 (month/year)
2. Tank capacity: 30,000 gallons
3. Tank shape: [X] Cylindrical [ ] Rectangular
   [ ] Spherical [ ] Other, specify_____
4. Tank dimensions: Diameter 15'6" Height 21' Length N/A Width N/A
5. Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Steel
6. Type of tank: [ ] External floating roof tank
   [ ] Internal floating roof tank
   [X] Fixed roof tank
   [ ] Vertical cylindrical tank
   [ ] Horizontal cylindrical tank
   [ ] Pressure tank
   [ ] Other, specify _____
7. Location of tank: [X] Outdoors [ ] Indoors [ ] Underground
8. Type of filling: [X] Splash [ ] Submerged [ ] Other, specify _____
9. If this tank is located outdoors and above ground, provide the paint color of the tank. N
   Stainless steel w/galvanized steel jacket
   [ ] Aluminum (specular) [ ] Light gray [ ] White
   [ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify _____
   Condition of paint: [ ] Good [ ] Poor N/A
10. If this tank is equipped with or vented to a vapor control system, complete (a) through of this item. N/A

    a) Type of vapor control system _____
    Manufacturer _____ Make or model _____
    Date installed (month and year) _____
    b) Date tank was equipped with or vented to vapor control system (month & year) N/A
    c) Specify the rate of emission or percent control (by weight) for any pollutants be controlled: _____
    (Attach calculations and test data to support response, unless previously submitted)

0054

DOE - FEMP
(Facility Name)
F3E-223 (FEMP 2-098)
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve. N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to a vapor control, identify the vapor control.

12. Operational Data (complete (a) through (g) of this item for all materials stored or to be stored. Attach additional sheets if necessary.)

a) Material Uranyl Nitrate Trade Name N/A
Density: 9.5 lbs/gal or _____° API Producer N/A
b) Temperature of stored material: Average AMB °F and Maximum AMB ° F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure is not known, write "unknown"):

i.) Actual vapor pressure: 0.46 psia at average storage temperature
(Aqueous Solution - essentially water) 0.46 psia at maximum storage temperature
ii.) Reid vapor pressure: Average _____ psi and minimum-maximum _____ - _____ psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: _____ psi gage at _____ °F

d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer the question below.)

Is it a photochemically reactive material? [ ] Yes [X] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [ ] yes [ ] No
If yes, identify type (EPA hazardous waste number) _____
f) Indicate the year (or 12-month period) for item (g): 1983
g) Annual throughput of material: 3,750,000 gallons.

Completed by Robert K. Roulston, Jr. Date Aug. 30, 1993

4798

Storage Tank
Emission Report
Thursday, September 16 1993

---- Tank Characteristics ----

Identification

Identification No.:	F3E-223
City:	Dayton
State:	Ohio
Company:	DOE-FEMP

Input Parameters

Type of Tank:	Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	21
Diameter (ft):	16
Liquid Height (ft):	21
Volume (gallons):	30000
Turnovers:	125
Net Throughput (gal/yr):	3750000

Roof Characteristics

Roof Type:	Cone
Roof Height (ft):	0.000
Slope (ft/ft):	0.00000
Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition:	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00
Pressure Setting(psig):	0.00

---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Farenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Farenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Farenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.39
Alpha (Roof) =	0.39
Liquid Bulk Temperature (Degrees Farenheit) =	53.24
Average Liquid Surface Temperature (Degrees Farenheit) =	56.22
Daily Maximum Liquid Surface Temperature (Degrees Farenheit) =	62.84
Daily Minimum Liquid Surface Temperature (Degrees Farenheit) =	49.60
Daily Vapor Temperature Range =	26.49

---- Storage Tank Vapor Pressure Information ----

Thursday, September 16 1993
Storage Tank Emission Report
Page 2

Speciation Option: None
Chemical Liquid: Uranyl Nitrate

Vapor Pressure of total mixture =	0.227238
Minimum Vapor Pressure of total mixture =	0.175816
Maximum Vapor Pressure of total mixture =	0.287205
Vapor Molecular Weight of Mixture =	18.000000
Vapor pressure range =	0.111389

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0007
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.044914
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	3750000
Liquid Volume (cubic feet) =	4222
Turnovers =	119
Turnover Factor =	0.4194
Working Loss Product Factor =	1.00
Total Working Losses =	153.16

---- Storage Tank Total Losses (AP-42) ----
Total losses = 153.16 lbs/year water vapor

URANIUM EMISSIONS

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

(1) At typical tank pressures and temperatures, the vapor pressure of the Uranyl Nitrate solution is equal to that of water.

(2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.

(3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.

(4) The emission factor has been determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.

(5) Maximum emissions are five times the calculated annual emissions.

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{153.16 \text{ lb water}}{\text{year}} \left| \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb water}} \right| = 9.19E^{-07}$ lb U/year

Maxumum Emissions: $9.19E^{-07}$ lb U/year x 5 = $4.60E^{-06}$ lb U/year

4798

RENEWAL APPLICATION FOR

PTO T071

0059

4798

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE

D.O.E.-Fernald Environmental Management Project Facility Name	Mr. Stephen M. Beckman Person to Contact
7400 Willey Road Facility Address	Post Office Box 398704 Mailing Address
Fernald Hamilton 45030 City County Zip	Cincinnati OH 45239-8705 City State Zip
513/ 738-6502 Telephone Area Number	513/ 738-6502 Telephone
#1431110128-T071 (Application no., if this is a renewal application)	4953 Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

___Appendix A, Process
___Appendix B, Fuel-Burning Equipment
___Appendix C, Incinerator
___Appendix D, Surface Coating or Printing Operation
xx Appendix E, Storage Tank
___Appendix H, Gasoline Dispensing Facility
___Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
___Appendix K, Surface Coating Line or Printing Line
___Appendix L, Solvent Metal Cleaning
___ Appendix M, Fugitive Dust Emission Sources
___ Specify Appendix No.
___Appendix N, Rubber Tire Manufacturing
___Appendix O, Dry Cleaning Facility
___Appendix P, Landfills
___Other Appendix ___
___Compliance Time Schedule

2. Description of Source (same as used on appendix): Tank F3E-224

3. Your identification for Source (same as used on appendix): 02-099

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

1) Appendix E
2) Emission Calculations

Stephen M. Beckman
Authorized Signature*
for Kenneth L. Alkema
Vice President Regulatory Programs
Title

9/17/93
Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

0060

FOR OFFICIAL USE ONLY
Premise No.___/___/___/____
Source No.___/____
Application No._____/_____

4798

DOE - FEMP
(Facility Name)
OEPA NO 1431110128 T071
FEMP ID NO. 02-099

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1. Tank identification: Name or number F3E-224 (FEMP 2-099) EP2-090 Date Installed 1952 (month/year)

2. Tank capacity: 30,000 gallons

3. Tank shape: [X] Cylindrical [ ] Rectangular
[ ] Spherical [ ] Other, specify _____

4. Tank dimensions: Diameter 15'6" Height 21' Length N/A Width N/A

5. Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Steel

6. Type of tank: [ ] External floating roof tank
[ ] Internal floating roof tank
[X] Fixed roof tank
[ ] Vertical cylindrical tank
[ ] Horizontal cylindrical tank
[ ] Pressure tank
[ ] Other, specify _____

7. Location of tank: [X] Outdoors [ ] Indoors [ ] Underground

8. Type of filling: [X] Splash [ ] Submerged [ ] Other, specify _____

9. If this tank is located outdoors and above ground, provide the paint color of the tank. N/A: Stainless steel w/galvanized steel jacket
[ ] Aluminum (specular) [ ] Light gray [ ] White
[ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify _____
Condition of paint: [ ] Good [ ] Poor N/A

10. If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item. N/A

a) Type of vapor control system _____
Manufacturer _____ Make or model _____
Date installed (month and year) _____

b) Date tank was equipped with or vented to vapor control system (month & year) N/A
c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled: _____
(Attach calculations and test data to support response, unless previously submitted)

0061

4798

DOE - FEMP
(Facility Name)
F3E-224 (FEMP 2-09
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve. N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to vapor control, identify the vapor contr

12. Operational Data (complete (a) through (g) of this item for all materials stored or to stored. Attach additional sheets if necessary.)

a) Material Uranyl Nitrate Trade Name N/A
Density: ~9.0 lbs/gal or _____° API Producer N/A

b) Temperature of stored material: Average AMB °F and Maximum AMB ° F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor press is not known, write "unknown"):

i.) Actual vapor pressure: 0.46 psia at average storage temperature
(Aqueous Solution 0.46 psia at maximum storage temperat
essentially water)

ii.) Reid vapor pressure: Average _____ psi and minimum-maximum _____ - _____ psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: _____ psi gage at _____ °F

d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer question below.)

Is it a photochemically reactive material? [ ] Yes [X] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [ ] yes [ ] No
If yes, identify type (EPA hazardous waste number) _____

f) Indicate the year (or 12-month period) for item (g): 1983

g) Annual throughput of material: 3,750,000 gallons.

Completed by Robert K. Roulston, Jr. Date Aug. 30, 1993

0062

Storage Tank
Emission Report
Thursday, September 16 1993

---- Tank Characteristics ----

Identification

Identification No.:	F3E-224
City:	Dayton
State:	Ohio
Company:	DOE-FEMP

Input Parameters

Type of Tank:	Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	21
Diameter (ft):	16
Liquid Height (ft):	21
Volume (gallons):	30000
Turnovers:	125
Net Throughput (gal/yr):	3750000

Roof Characteristics

Roof Type:	Cone
Roof Height (ft):	0.000
Slope (ft/ft):	0.00000
Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition:	Good
Roof Color/Shade:	Aluminum/Specular
Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00
Pressure Setting(psig):	0.00

---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Farenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Farenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Farenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.39
Alpha (Roof) =	0.39
Liquid Bulk Temperature (Degrees Farenheit) =	53.24
Average Liquid Surface Temperature (Degrees Farenheit) =	56.22
Daily Maximum Liquid Surface Temperature (Degrees Farenheit) =	62.84
Daily Minimum Liquid Surface Temperature (Degrees Farenheit) =	49.60
Daily Vapor Temperature Range =	26.49

---- Storage Tank Vapor Pressure Information ----

Thursday, September 16 1993
Storage Tank Emission Report
Page 2

Speciation Option: None
Chemical Liquid: Uranyl Nitrate

Vapor Pressure of total mixture =	0.227238
Minimum Vapor Pressure of total mixture =	0.175816
Maximum Vapor Pressure of total mixture =	0.287205
Vapor Molecular Weight of Mixture =	18.000000
Vapor pressure range =	0.111389

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0007
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.044914
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	3750000
Liquid Volume (cubic feet) =	4222
Turnovers =	119
Turnover Factor =	0.4194
Working Loss Product Factor =	1.00
Total Working Losses =	153.16

---- Storage Tank Total Losses (AP-42) ----
Total losses = 153.16 lbs/year water vapor

URANIUM EMISSIONS

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

(1) At typical tank pressures and temperatures, the vapor pressure of the Uranyl Nitrate solution is equal to that of water.

(2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.

(3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.

(4) The emission factor has been determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.

(5) Maximum emissions are five times the calculated annual emissions.

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{153.16 \text{ lb water}}{\text{year}} \left| \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb water}} \right| = 9.19E^{-07}$ lb U/year

Maxumum Emissions: $9.19E^{-07}$ lb U/year x 5 = $4.60E^{-06}$ lb U/year